Alex D. Felker
Vice President-Technology
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TIMEWARNER

September 8, 1993

Mr. William Caton
Acting Secretary
Federal Communications Commission
1919 M Street, NW
Washington, D.C. 20554

RE: Ex Parte Filing
Personal Communications Services
GEN Docket No. 90-314;
Emerging Technologies
ET Docket No. 92-9

Dear Mr. Caton:

Enclosed are an original and one copy of documents addressing various issues related to personal communications services. One document addresses the bandwidth requirements of PCS. The other examines the likely availability of capital to construct these networks. On this date, Dennis R. Patrick, Chairman and CEO of Time Warner Telecommunications, provided a copy of these documents to Chairman James Quello during a meeting in which they discussed the subject of the enclosure. Please associate the material with the above-captioned dockets.

Sincerely,

Alex D. Felker

Enclosure

(Second page Not Submitted?)

Over and above these FCC objectives we also perceive that the recent budget process has set a requirement of $7-10 billion of proceeds from the PCN auction process.

In addition to our extensive experience in the telecommunications, media and technology areas we have also reviewed the work of industry experts and your own analyses.

We have not (i) performed independent tests of consumer demand; (ii) held any discussions with the FCC or other parts of the Federal Government; (iii) held discussions with any of your specific potential partners or competitors.

In conclusion, though no one is omniscient regarding the future of PCN, it is our belief that the best way for the government to gain $7-10 billion dollars and provide consumers with the benefits of PCN promptly is the auction and issuance of 2, or at most, 3 licenses of broad geographic boundaries.

Sincerely,

Glenn Schwartz

PCS Assignment Bandwidth of at Least 40 MHz Is Required To:

- Support Vocoder and Data Rates Competitive with Existing Wire/Wireless Nets
- Facilitate Prompt Service Availability via Band Sharing with Incumbents
- Lower Subscriber Costs
  - Increases trunking efficiency
  - Decreases investment in frequency reuse
- **Establish Coverage/Capacity Parity Between 2 GHz PCS and 800 MHz Cellular**

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30 MHz Does Not Facilitate PCS/Microwave Co-Existence

- **Microwave channels are generally 10 MHz**
  - Receiver passbands frequently wider than 10 MHz
  - Adjacent channels generally vacant
- **40 MHz pairing (20 X 20 MHz) allows access to some spectrum immediately**
- **30 MHz pairing (15 X 15 MHz) can result in:**
  - Competitors jointly negotiating with microwave licensee
  - Inability to use any portion of assignment in certain congested areas

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DIFFERENCES IN PHYSICAL PROPERTIES OF 800 MHZ AND 2 GHZ

- Higher frequency signals propagate more poorly in free space
  - Results in 8 - 10 dB greater transmission loss at 2 GHz
- Greater fading at 2 GHz
  - For equivalent coverages, implies greater average received power
- Lower handset power
  - Cellular: 600 mW; PCS: probably < 300 mW

If the effects of these properties are not offset, 2 GHz PCS systems will require at least 4 times as many cell sites as 800 MHz cellular systems for comparable levels of coverage & capacity

CELLULAR/PCS PARITY

TO PUT PCS COVERAGE & CAPACITY ON PAR WITH CELLULAR REQUIRES:

- Equivalent numbers of base stations and comparable power levels
- Sufficient spectrum to make PCS traffic handling capacity comparable to cellular

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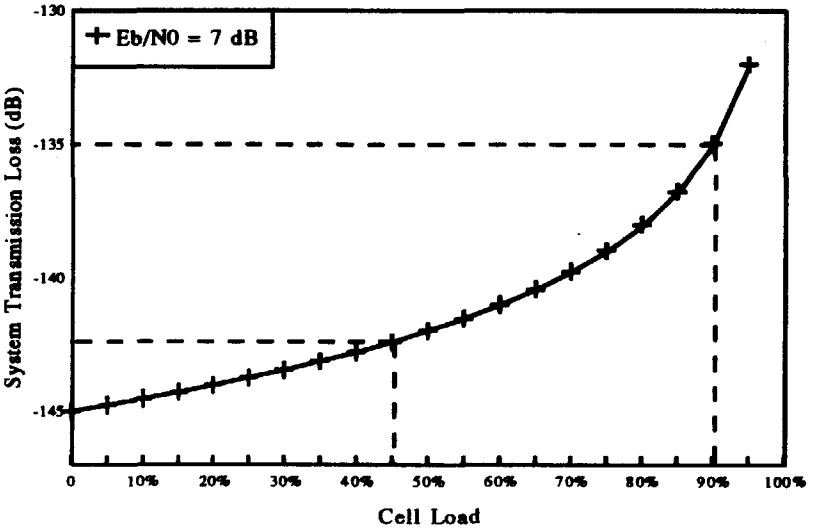
Q-CDMA PERMITS COVERAGE/CAPACITY TRADEOFF

For a given radiated power level:

- Coverage may be increased by reducing number of active voice channels
- Number of voice channels may be increased by reducing coverage

Q-CDMA SYSTEM TRANSMISSION LOSS IS A FUNCTION OF LOADING



To obtain coverage and capacity parity with cellular's 25 MHz, PCS must have at least 40 MHz of CLEAR spectrum

$$T(r) = CNR_{min} + (N_0W)_c - p_t - 10\log(1-X)$$

Where,
X = Loading Factor

Source: The CDMA Network Engineering Handbook
Vol. I, Qualcomm, Inc; November 23, 1992